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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/424,500    02/22/00    SATO    A    104788

OLIFF & BERRIDGE  
PO BOX 19928  
ALEXANDRIA VA 22320

MMC1/0828

EXAMINER

LEE, G

ART UNIT

PAPER NUMBER

2825

DATE MAILED:

08/28/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trad marks**

# Office Action Summary

Application No.

09/424,500

Applicant(s)

SATO, AKIRA

Examiner

Granvill D Lee, Jr

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) 15-30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: Items #52 and #84 while depicted in the drawings are not disclosed in the specification. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

A. Claims 1, 3-4 12, 14 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase *substantially on the axis* leaves too much room and uncertainty for designs relatively close to a given axis.

B. Claims 1,3-4,12, 14-16 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The resin injection port is not depicted in the drawings or elaborated enough to disclose where along the support pin is the location of this element. Clarification and or correction is required.

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US Pat. 5,733,802) in view of Hara (US Pat. 5,498,902) and further in view of JP Doc. 11-111746.

In view of claims 1 and 12, Inoue et al. reveals that a semiconductor package can be made by using an upper mold (Fig. 1a #10a), a lower mold (#10b), a cavity portion (#10c) and a resin sealant (#14). The package further consists of a semiconductor chip (Fig. 1b #11), a lead frame (#12), and a die pad (#12a). Hara depicts an encapsulated semiconductor package with both a resin injection port (Fig. 4 #45), a support pins (#42 & #43) and a heat radiator plate (Fig. 1 #30).

However, both Inoue et al. and Hara fail to disclose support pins along the axis of the resin injection site. JP. Doc 11-1117446 (JP '446), however discloses support pins along the axis of the resin injection site (Fig. 2). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teachings of Inoue et al. and Hara with those of JP '446 the expectation of achieving better mounting results, since the

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device in the cavity portion can be held using both resin and the movable pins (Hara Col. 5 lines 17-36).

In view of claim 2, Hara unfolds a die pad (Fig. 1 #23) in contact with support pins (Fig. 2 #32) to transfer heat (Col. 7 lines 17-20).

In view of claims 3-4 and 14, JP '446 discloses support pins along the axis of the resin injection site (Fig. 2)

In view of claim 5, Hara shows that the support pins (Fig. 4 #43&42) are in contact with the semiconductor assembly (Fig. 4 #21).

In view of claims 6-7, Hara discloses a die pad supporting a semiconductor assembly from the lower position (Fig. 5 #47&#48).

In view of claim 11, JP '446 depicts two pairs of pins (Fig. 1 #6 & #7) that connect die pad (4a) and lead frame (5a).

In view of claim 13, Hara depicts support pins (Fig. 2 #32) holding heat radiator plate (Fig. 1 #30).

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US Pat. 5,733,802), Hara (US Pat. 5,498,902) and in view of JP Doc. 11-111746 and further in view of Ootsuki (5,693,984).

In view of these claims, Inoue et al. reveals that a semiconductor package can be made by using an upper mold, a lower mold, a cavity portion and a resin sealant. Hara depicts an encapsulated semiconductor package with both a resin injection port, a support pins and a heat radiator plate. JP. Doc 11-1117446 discloses support pins along the axis of the resin injection site. Yet,

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all of the three inventors fail to point out a design where the die pad can be over and/or under the semiconductor device attached. Ootsuki teaches a design where the die pad can be either over or under the semiconductor device. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the teachings of all the above inventors with Ootsuki with the expectation of achieving boarder design results, since placing the die pad above or below the device portion opens the possibility of packaging a larger range of devices.

### ***Allowable Subject Matter***

Claims 15-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications for the examiner should be directed to Granvill Lee whose telephone number is (703) 306-5865. The examiner can be normally reached on Monday thru Thursday from 7:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are not successful, the examiner's supervisor, Matthew Smith can be reached on (703) 308-1323. The fax phone number for this group is (703) 308-7722.

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Any inquiry of a general nature relating to status or otherwise should be directed to the receptionist whose telephone number is 703-308-1782.

Examiner  
Granvill Lee  
Art Unit 2825

G1  
8/20/01

A handwritten signature in black ink, appearing to read "Matthew Smith", written in a cursive style.

MATTHEW SMITH  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800